

Abstract

The Power Subsystem for the Mars μ Rover

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The paper will discuss the current status of the Mars μ rover power subsystem. The paper will present the status of the μ Rover development, its scientific objectives, and architecture. The Mars μ Rover has a number of very stringent requirements which mandate new and unique approaches. In order to reduce costs, risks were weighed and decisions made. The decision process and the trades made for this evaluation will be discussed.

The paper will focus on the status of the power subsystem conceptual design and implementation approach. A functional block diagram will be presented and discussed in detail. The status of contracts and design reviews will be presented. By the time of the presentation the power subsystem will be breadboarded and the breadboard results will be presented.

The μ Rover power subsystem is a direct energy conversion system utilizing PV cells for primary power and primary batteries for emergency power. Multiple power conditioners are utilized to transform from the nominal 15 V_{dc} to the appropriate operating voltage. The thermal design will be discussed to show how the electronics can be kept warm, even at night. The startup process for wake up each morning will also be discussed.

The Mars μ Rover power design is a new and unique opportunity for low cost power subsystem development. This paper will show how this can be accomplished while minimizing project risk.